THE CONTRACTOR	THE OWNER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia **The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4**	GESBAU 2ACE ITALCONSULT

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METHOD STATEMENT FOR CONCRETE WORKS

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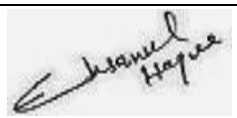
Signature:				
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1. SCOPE

This Method Statement outlined the following items;

- Construction equipment to be used for concreting.
- Work procedure for the cast in-situ reinforced concrete structure.
- Material to be used.
- Site preparation.
- Storage of components.
- Responsibility of the individuals'.
- Risk assessment.
- Inspection and test plan.
- Inspection checklist.

2. PURPOSE

Structural frame is the essential element of any building which can be constructed based on Material such as steel and reinforced concrete. A reinforced concrete structure is made up of many types of structural members, including footings, Columns, beams, slabs and walls which are either cast into forms at the site (cast in-situ). The purpose of this Method Statement is to describe the detailed sequence of the work for the Construction of cast insitu reinforced concrete structure the rough out the buildings in The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4.

3. DEFINITIONS

MOI	Ministry of Interior (Employer)
GIJV	Consultant: Gesbau Italconsult Joint Venture
BEC	Beijing Emirates International Construction Co. (Contractor).
IFC	Issued For Construction
QD	Quality Department
QCP	Quality Control Plan
ITP	Inspection and Test Plan
JSA	Job Safety Analysis
STA	Safety Task Assignments
QCI	Quality Control Inspector

4. REFERENCES

Specification and Documents listed below are referred to;

- **KAP5- Group 4** (03100, 03200, 03300, 03450, 03550).
- Project Specifications.

4.1 SAOS Reference (Saudi Arabian Standards Organization)

- SSA 142 (Physical and mechanical methods to test Portland cement.)
- SSA 143 (Normal & Fast-Harding Portland cement).

4.2 ACI Reference (American Concrete Institute):

- **ACI 117** Tolerances for Concrete Construction and Materials and Commentary
- **ACI 211** Practice recommended for the selection of regular, normal and heavy concrete weight
- **ACI 214** Evaluation of Strength Test Results of Concrete
- **ACI 301** Structural Concrete
- **ACI 302** Recommended Practice for the establishment of floors and concrete slabs
- **ACI 304** Guide for Measuring, Mixing, Transporting and Placing Concrete
- **ACI 305** Hot Weather Concreting
- **ACI 308** Guide to Curing Concrete
- **ACI 309** Guide for Consolidation of Concrete
- **ACI 318** Building Code Requirements for structural concrete (ACI 31805) and commentry (ACI 318R-05)
- **ACI SR 66** Detailed brochure of the American Concrete Institute.

4.3 ASTM Reference (American Society for Testing and Materials):

- **ASTM C31** Standard Practice for Making and Curing Concrete Test Specimens in the Field1.
- **ASTMC33** Standard Specification for Concrete Aggregates1
- **ASTMC39** Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens1
- **ASTMC42** Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete1.
- **ASTMC88** Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulfate1.

- **ASTMC123** Standard Test Method for Lightweight Particles in Aggregate1
- **ASTMC138** Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete1.
- **ASTMC142** Standard Test Method for Clay Lumps and Friable Particles in Aggregates1.
- **ASTMC143** Standard Test Method for Slump of Hydraulic-Cement Concrete1.
- **ASTMC150** Standard Specification for Portland Cement1.
- **ASTMC156** Standard Test Method for Water Retention by Concrete Curing Materials1.
- **ASTMC171** Standard Specification for Sheet Materials for Curing Concrete1.
- **ASTMC173** Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method1.

- **ASTMC231** Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method1.
- **ASTMC260** Standard Specification for Air-Entraining Admixtures for Concrete1.
- **ASTMC309** Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete1.
- **ASTMC494** Standard Specification for Chemical Admixtures for Concrete1
- **ASTMC535** Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine1.
- **ASTMC618** Standard Specification for Coal Fly Ash and Raw or Calcites Natural Pozzolan for Use as a Mineral Admixture in Concrete1.
- **ASTMC685** Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing1.
- **ASTMC881** Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete1
- **ASTMD75** Standard Practice for Sampling Aggregates1.
- **ASTM D1190** Standard Specification for Concrete Joint Sealer, Hot-Applied Elastic Type1
- **ASTMD1191** Methods of test to prevent leak links concrete.
- **ASTMD1751** Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (No-extruding and Resilient Bituminous Types) 1.
- **ASTMD1752** Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction1.
- **ASTME11** Standard Specification for Sieves of wired fabric for the purpose of testing.
- **ASTME96** Methods of test for water vapor transmission of materials.

- **ASTME154** Methods of test for obstacles evaporation of water used in contact with the soil under Concrete slabs and on walls or ground cover.

4.4 Structural Concrete Specification (03100, 03200, 03300, 03450, 03550).

4.5 BEC HSE Plan.

4.6 BEC Quality Assurance Plan.

4.7 BEC Environmental Control Plan.

4.8 BEC Traffic Management Plan.

4.9 Construction Drawing/s.

4.10 Material Approval.

5. RESPONSIBILITIES

5.1. Project Manager

The Project Manager is responsible for liaising with the supplier with regards to deliveries, fabrication dates, conveying the information to the Construction manager ensuring the method statements are approved and passed to the Construction Manager

5.2. Construction Manager

The Construction Manager is responsible for the verification of this method statement and of any subsequent revisions and application of method statement for the works, ensuring the method statements are passed to the laydown team and QA/QC Manager with the delivery dates and advance delivery documentation.

5.3. HSE Manager

The HSE Manager is responsible for reviewing this procedure method statement, ensuring that the method statement, JSA and STA are carried out at the required time by the Safety Officer. Ensuring that all operatives are briefed on the method statement and operatives have signed to confirm receipt of briefing.

5.4. Safety Officer (reports directly to the HSE Manager)

The Safety Officer is responsible for the following:

- Insure that all safety requirements to start the activity are provided by the construction group as per project HSE manual and specification.
- To conduct daily inspection to ensure that safety requirements are being maintained up to the completion of this activity.
- Ensure JSA and STA have been carried out.

- Ensure operatives understand the method statement and are briefed on the method statement.
- Advise operatives on their responsibilities and safety requirements.

5.5. Site Engineer

- The Site Engineer is to ensure construction is being carried out to the required specification and Method Statement
- To ensure that all parties required any kind of inspection or test are suitably informed as to the delivery program
- Prepare documents for Inspection Request (IR) and notify QC when portion of the work are ready for inspections, as per the relevant QC Procedure.
- Ensure that notification time to QC is sufficient to meet notification time to client as per relevant QCP

5.6. Site Foreman

- Supervise the execution of the work and ensure that it is being done as per project approved specification and drawings and approved work procedure.
- Ensure that manpower and equipment are properly distributed.
- Coordinate with other construction team working adjacent to his location of work.
- Conduct JSA and STA to ensure that each member of the crew is aware of the hazards.
- Insure that all control measures to arrest the hazard are being implemented
- Arrange for the required materials, tools and equipment.
- Prepare and submit the daily report.

5.7. Quality Control Inspector (QCI)

- The QC Inspector is responsible for checking and verifying the documentation for the Inspection Request (IR) submitted by the Site Engineer prior to submit the same to the client for inspection.
- QC Engineer/Inspector is responsible for rejecting the work or prepare observation report if the work is found not in-compliance or unsatisfactory.
- The Observation Note will specify the commented work by the QC Engineer/Inspector and submit for rectification prior to carry out the Inspection Request.
- Conduct daily inspection to check the material prior to unloading of material and ensuring material is stored correctly with no damages.
- Coordinate with the Site Engineer and Client representative during inspection.

6. EQUIPMENT & MATERIALS

6.1. Plant

- Survey instruments.
- Mobile/tower cranes.
- Air compressor.
- Truck mixers or Transit Mixer.
- Boom pump/s.
- Stationery pump and boom (If required).
- Quality control testing equipment.
- Spud vibrators.

6.2. Other

- Calibrated measuring tape
- Carpenter's tools
- Brush or roller for form release oil
- Wood or metal concrete levelling strips.
- Shovel or rake
- Aluminum or wooden straight edge
- Wooden float
- Steel trowel or power float machine
- Scraper or broom
- String lines
- Trowels
- Spirit level
- Plumb bob
- Shovel
- Scaffolding
- Hammer
- Nips
- Angle Grinder
- Motor driven saw

Note: The type and quantities of equipment are subject to change to suit the site requirements and to meet the structural concrete program.

6.3. Materials

- Sand
- Cement
- Water
- Admixture
- Reinforcing rods

- Tying wire
- Lintels
- Expanded mesh
- Plyetehne Sheets
- Hessian Cloth

7. HSE

7.1. Before any work commences, the Engineer shall ensure that all relevant permits are obtained and work shall commence following the specific measures itemized in the permit.

7.2. The work area will be clean and leveled prior to the work commencing, a walkway route will be demarcated to and from the work area, and storage area,

7.3. The Surveyor/Engineer in coordination with the Safety Officer shall check that all works are being done in accordance with the project HSE manual. All operatives will receive a (STA) Safety Task Assignment prior to commencing the works. This Method Statement will be briefed to all operatives carrying out the works.

8. PROCEDURE

8.1 Pre-Installation

A. Rebar and reinforcing mesh to be delivered to site should be protected, Handled and stored in accordance with the Manufacturer's standards and in compliant With **KAP5- Group 4**.

B. Design mix will be prepared for each concrete grade to achieve the Compressive strength as per Structural Concrete Specification and submitted to the Engineer for approval.

C. Ensure that all drawings have been verified and approved. The shop drawings shall be coordinated with E&M for any service that will be located within structural Concrete.

D. All subsystem and conduit shall be embedded for minimum covering in Accordance with structural design.

E. Datum level and a datum line along with datum points will be established with the Engineer.

F. Structural concrete work for the footings shall commence after the completion of waterproofing.

G. Installation of structural concrete shall commence once the specified formwork is clean and safe.

H. Any discrepancy between document and actual site condition shall be reported to the site engineer prior to start of work.

I. Placement of concrete should not be carried out or stopped during rain unless adequate protection is provided to prevent damage to the surface mortar.

8.2 Site preparation

A. Permanent reference points for structural concrete levels and grids shall be established as offset from datum points by surveyor using survey instruments.

B. Adequate barricades and warning signs will be placed on the route leading into and out from the works.

C. Incoming and outgoing traffic will be directed and managed by appointed signalman.

D. A suitable area for truck wash will be determined at site in order to avoid the Spillage of cleaning water and cement slurry. Every week, this area should be cleaned properly.

E. Adequate lighting will be provided to all working areas during night works to Allow for proper installation after due approval from the Engineer.

8.3 Formwork

A. Prefabricated panel modules with timber beams and steel walers will be used for the construction of walls/columns and where necessary will be adapted with Variable plywood infill's or adjusted to fit with the size of columns.

B. Formwork of circular columns will consist of prefabricated two halve shells with Steel face sheet.

C. Table or flying form system will be used during construction of slabs.

D. Forms will be coated with approved release oil, where necessary before the Form is placed.

E. Formwork will be erected in line and level with all the corners in 90 degrees as per the drawings. Joints of plywood shall be protected to avoid any leakage of cement Slurry during the concrete works.

F. Formwork shall be tight to prevent loss of mortar from concrete.

G. Formwork will be inspected before the installation of steel reinforcement to confirm that the dimensions and locations of structural members are in compliance With approved drawings.

8.4 Steel Reinforcement (rebar/dowel/mesh) and embedded item

A. Steel reinforcement and dowel bars will be supplied from an approved supplier, as supplier cut-and-bent to the shapes shown on approved drawings and approved bar bending schedules for particular section of work. The same will be transported from the supplier's yard by trailers and will be carefully unloaded at site by crane.

B. Steel rebar and dowel bars will be fixed as per approved shop drawings and Secured with annealed mild steel tie wire so that they remain in their correct respective positions.

C. Where required, rebar will be extended horizontally and vertically with a length indicated on drawings to provide the proper overlap with the consecutive bar.

D. The spacer blocks, which will be used during steel fixing, will be made out of the same approved mix design as that of structural concrete or approved plastic spacers will be provided.

E. Spacer blocks will be placed both horizontally as well as vertically in order to hold reinforcement in position and to maintain the below listed minimum clear space between reinforcement and formwork:

- In walls and columns, a 5in (125mm) minimum space between the vertical mats.
- For single mat reinforcement at least 2in (50mm) clear space between form and reinforcement.
- Horizontal clear space between bars and the form should be 2in (50mm), 1.25 times the bar size or 1.5 times the maximum aggregate size which ever will be large.

F. Similarly mesh reinforcement will be supplied from an approved supplier in Standard sizes and be fixed as per approved shop drawings. During installation:

- Use mesh reinforcement in longest practicable lengths or as shown on the Drawings.
- Place on bar supports spaced to minimize sagging and secure against displacement after positioning accurately.
- Lap edges and ends of adjoining sheets at least one 300mm and offset laps of adjoining sheet widths to prevent continuous laps in either direction.
- Lace overlaps with tie wire.

G. Before fixing any reinforcement first time for every supplier, relevant tests (tensile, re-bend and bend) will be carried out by an independent Testing Laboratory and results will be submitted to the Engineer together with the mill certificates.

H. All reinforcement will be cleaned prior to the pouring of concrete as to be free of loose rust, mill scale, oil, grease or other deleterious materials.

I. All extraneous materials including water will be cleared by the use of compressed air immediately prior to the placement of concrete.

J. All embedded items and custom made anchorage bolts/plates will be placed according to the approved drawings.

8.5 Production and transport of concrete

A. Ready mixed concrete or concrete that is manufactured at a batching plant will be used as per the grades listed below (as per MOI-03300/2.03/A):

Grade of Concrete	Compressive Strength after 28 days (MPa)
C-20	20
C-30	30
C-35	35
C-40	40

B. Mix designs for each grade of concrete to be used will be submitted For Engineer's approval.

C. Water used in mixing concrete should be clean and free from oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement. Mixing water should not contain excessive amounts of chloride ion.

D. Suitable admixtures shall be included in the concrete mix at the time of batching as per the dosage and method approved by The Engineer.

E. Ready mixed concrete will be transported from batching plant to work site by mixer trucks.

F. Printed delivery notes signed by an authorized person showing concrete plant records for all deliveries shall be kept for record.

8.6 Concrete placement

A. The recommended maximum horizontal delivery distance to transfer concrete by manual buggies is 200 ft. (60 m), and for power buggies, 1000 ft. (300 m). Manual buggies range in capacity from 6 to 8 ft^3 (0.2 to 0.3 m) with placing capacities averaging from 3 to 5 yd^3 (3 to 5 m^3) per h. Power buggies are available in sizes from 9 to 12 ft^3 (0.3 to 0.4 m^3) with placing capacities ranging from 15 to 20 yd^3 (14 to 18 m^3) per h, depending on the distance travelled.

B. Chutes are frequently used for transferring concrete from higher to lower elevations. They should have rounded corners, be constructed of steel or be steel-lined, and should have sufficient capacity to avoid overflow. The slope should be constant and steep enough to permit concrete of the required slump to flow continuously down the chute without segregation. Drop chutes are circular pipes used for transferring concrete vertically from higher to lower elevations. The pipe should have a diameter of at least eight times the maximum aggregate size at the top 6 to 8 ft. (2 to 3 m) of the chute, but can be tapered to approximately six times the maximum aggregate size below. When a mixer truck cannot get close to the formwork, stationery concrete pump with boom, boom pump, dumper or wheel barrow will be used for transporting the Concrete

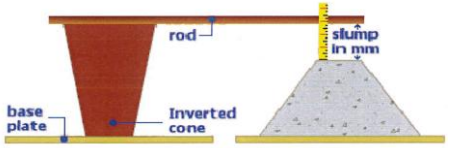
C. In case boom pump will be used, it will have minimum capacity of 60 m^3/hour and boom length of 36, 42, 52m. Additional boom pumps shall be kept at site as standby for bulk concreting.

D. Concrete pump will be positioned and set-up ensuring that the area is level, solid and free of obstructions.

E. Concrete pump and boom will be primed with a mixture of sand-cement slurry ahead of the concrete and slurry will be placed on the ground safely away from the work area.

F. Ready-mix concrete will be delivered to site with a consistency as per the specified slump class and close to the target slump (as per MOI-03300/2.04/A/7/a-b):

- Reinforced Foundation Systems: slump 100 mm ±25mm.
- Other Concrete: 100 mm ±25mm slump.
- Sloping Surfaces: 100 mm ±25mm slump.
- Slump of concrete with super-plasticizer shall not exceed 200 mm.



G. Consistency will be used for structural concrete throughout the project.

H. Use150mm diameter cylinder with a height of 300mm or 100mm diameter cylinder with 200mm height will be used for concrete sampling for compressive strength test. Make sure that the apparatus and associated equipment are clean and free from hardened concrete and superfluous water. Apply a light coat of form release oil on the internal faces of the mold in order to enable easy disassembly later, Place the molds on level firm ground and fill 1/3 of each mold by volume, By using the tamping rod, compact 35 times evenly over the entire cross section of the sample, During the compaction of the first layer, do not forcibly strike the tamping rod to the bottom of the mold.

I. Mark the cylinder surface with an identification number with a nail or match stick and record these numbers in respect with the concrete truck and location of pour where the sampled concrete is obtained.

J. Once the necessary time has passed and the cubes have achieved the necessary Strength, de-mold samples without damaging and mark a reference number with Waterproof felt pen on the molded side, in respect with the previous identification number. Submerge cylinders in a clean water bath or place in a curing tank until they are ready to be tested, once de-molding is complete, clean the molds; reassemble and make ready for the next set of samples.

K. Also, concrete temperature, ambient temperature and other weather conditions will be checked and recorded for documentation and control purposes.

L. The temperature of concrete will not exceed 32°C at time of placement. (MOI/3300/G/2)

8.7 During hot weather

A. Use chilled water or fully melted chopped ice to control the temperature of fresh mixed concrete.

B. Schedule and make arrangements to pour in the cooler time of the day (at night or early morning) in order to minimize the effects of heat while finishing.

C. Wet down all the forms and ground just before pouring the concrete to reduce the rate of evaporation of the moisture in the concrete mix, to prevent plywood faced forms from absorbing moisture from the concrete and to keep steel reinforcing from becoming hot.

D. Adding water to the mixture is not allowed in order not to lower the strength, increase cracking and reduce the durability. Slump should be maintained at the plant only.

E. Limit the time between placing the concrete and final finishing. Use a fog type spray nozzle to maintain surface moisture and to prevent evaporating away the "bleed" water out of the concrete mix before it can be trowel-led smooth.

F. Erect windbreaks to reduce the chances of a dry wind that will cause the surface to cure too fast and crack. Curing should be done for at least 7 days.

G. As soon as the concrete is finished, begin a moist cure by keeping the finished surfaces and pour area damp for the next few days. On extremely hot or windy days, reschedule the pour for a day with more favorable conditions upon receiving approval of Engineer.

H. Concrete should be cooled to ambient temperatures to avoid thermal cracking; a temperature differential may be permitted when protection is discontinued.

8.8 During cold weather

A. Cold weather is defined as a period when, for more than 3 consecutive days, the following conditions exist:
1) The average daily air temperature is less than 40 F (5° C) and
2) The air temperature is not greater than 50° F (10° C) for more than one-half of any 24-hr period.

B. Use a concrete mix with a low water volume so that it will have less moisture to reduce the cure time.

C. Wait until the sun is shining on the pour site.

8.9 while casting a footing or foundation

A. Position the cement mixer's chute or the hose of the pump to pour the concrete into one end of the form.

B. Beginning from one side, fill the form moving towards the other side,

C. Exercise care not to push reinforcement cage by mixer's chute

D. Consolidate by using vibrators as the footing/ foundation fills

E. Make subsequent passes in the same way.

F. After filling the form, tamp wet concrete and level it with a wooden or aluminum Straight edge by pushing and pulling it in a sawing motion across flush with the top of form.

8.10 while casting a wall

A. Beginning from a corner, fill the form and move forward, allowing the concrete to flow down.

B. Proceed in this manner around the entire perimeter of the formwork.

C. Consolidate by using vibrators as the wall fills.

D. As returning to the original starting point, make subsequent passes in the same way.

E. Tap the formwork externally time to time to remove any air pockets.

F. As the concrete settles, fill top sinks with more wet concrete and screed top of the wall flush with the top form using a wooden float.

G. After stripping the formwork, repair honeycombing or other large blemishes and patch the holes/voids flush with surrounding surfaces after getting approval of Engineer for the material and method to be used.

8.11 While casting a column

A. Pour wet concrete into the formwork with concrete pump.

B. Tap the formwork externally time to time to remove any air pockets

C. As the concrete sets, fill top sinks with more wet concrete and screed top of the wall flush with the top form.

D. After stripping the formwork, repair honeycombing or other large blemishes and patch the holes/voids flush with surrounding surfaces after getting approval of Engineer for the material and method to be used.

8.12 while casting a slab

A. Fix suitable timber or metal edge/intermediate leveling strips with 3-4 m. interval as to be support for the compaction and adjust the height as per the required level.

B. Position the cement mixer's chute or the hose of the pump to pour the concrete into one end of the form.

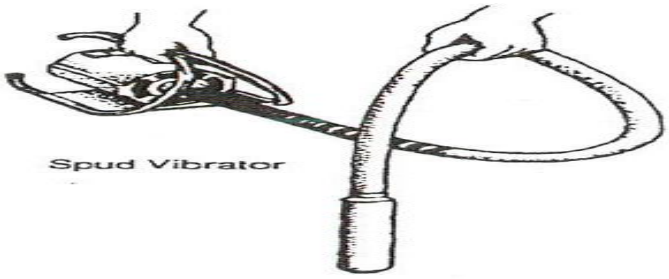
C. Begin the pouring ready-mix concrete onto the formwork.

D. Allow reaching to the edges by shoveling pulling and vibrate.

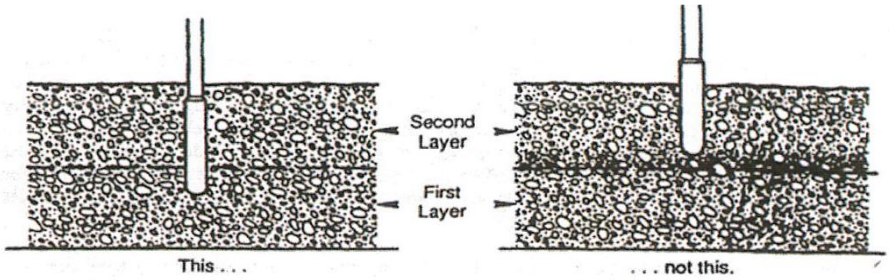
E. As the formwork fills with a rough level, tamp wet concrete with a wooden or Aluminum straight-edge and strike off to level by sliding it back and forth in a Swinging motion along the pre-installed leveling strips.

F. Remove leveling strips as working towards the other end and gently fill in the voids with concrete without causing damage to the leveled concrete.

8.13 Backup vibrator/s in serviceable condition will be kept ready on site for larger Pours and equipment problems.



8.14 Concrete shall be compacted in its final position within initial setting time of the cement after Discharge from the mixer truck. Do not over vibrate to avoid segregation and maximum time of vibration shall be 15 seconds.



8.15 Details and location of construction and movement joints will be in conformity With the relevant shop drawings approved by the Engineer.

8.16 If concreting is ever interrupted more than initial setting time of the cement for the placed concrete to Harden, a construction joint will be provided after getting approval of Engineer.

8.17 Site Engineer and surveyor should double check the lines and levels of the dead shutter along with starter bars of columns and walls and it shall be checked and approved by consultant through IR.

8.18 Curing of in-place concrete

A. Once the concrete has been delivered, placed, and finished, fresh concrete will be cured in order to control loss of surface water. Curing of concrete should be for least for 7 days.

B. The exposed horizontal surfaces of fresh concrete will be covered immediately with tarpaulins, polythene or similar sheeting as soon as

leveling works are completed and shine on the surface of concrete is disappeared.

C. Similarly vertical concrete surfaces on columns and retaining walls will be covered with wet Hessian cloth after removal of form work.

D. The edges of Hessian cloth will be lapped and materials will be weighted down to prevent blow away.

E. Close monitoring of the curing will be maintained to ensure that the concrete surface is not allowed to dry.

8.19 Temperature Control and Mass Pours

A. The equipment and method used for placing mass concrete should minimize separation of coarse aggregate from the concrete. Although scattered pieces of coarse aggregate are not objectionable, clusters and pockets of coarse aggregate are and should be scattered before placing concrete over them.

B. ACI 207.2R and 207.4R contain additional information on cement types and effects on heat generation. The following types of hydraulic cement are suitable for use in mass concrete construction:

- Portland cement—Types I, II, IV, and V, as covered by ASTM C 150;
- Blended cement—Types P, IP, S, IS, I (PM), and I(SM), as covered by ASTM C 595; and
- Hydraulic cement—Types GU, MS, HS, MH, and LH, as covered by ASTM C 1157.

8.20 Protection of in-place concrete

A. Movement of heavy loads and work upon the exposed surfaces will be restricted by providing signs and barricades.

B. If it is required paths for such traffic and work will be provided by laying down tempered Masonite, plywood or other suitable load-distributing material.

C. Utilize non-staining Kraft paper or similar and tape the seams in areas which could receive harm (spillage, stain) to the finished concrete surface.

8.21 Removal/Stripping of Formwork

A. The formwork will be stripped in accordance Engineers Approval.

B. All formwork will be removed without shock and harmful vibration that might damage the concrete.

C. After removal of formwork, concrete surfaces will be inspected visually and all repairable defective areas of structural members will be patched immediately.

D. The stripped formwork will be dry-cleaned prior to the next application using a scraper or broom.

8.22 Testing of Concrete

A. Testing of hardened concrete for specified compressive strength will be carried out on composite samples taken from concrete. Two of the six cylinders in a composite sample will be tested by Independent or Site Test Laboratory at an age of 7 days and other three cylinders at an age of 28 days. One cylinders will be held in reserve for further testing as required.

9. Quality Assurance

9.1 All Site activities will be in compliance with the approved BEC Project Quality Plan and Quality Control Program.

9.2 Prepare 9 cylinders for each 115m3 of concrete. 3 cylinders for 7 days testing, 3 for 28 days and remaining 3 for future requirements.

9.3 The concerned Site Engineer will coordinate with the QA/QC Engineer to carry out internal inspection for the following completed works:

Setting out, Excavation and Backfilling, Fixing of required reinforcing steel bars and concrete pouring.

9.4 Material Inspection Request (MIR) will be submitted for each consignment of the project Bulk/raw materials delivered to the site depot.

9.5 All required tests will be carried out either by approved independent Testing Laboratory or Site Laboratory in accordance with the specifications.

9.6 Inspections and test results will be recorded in Quality Control Forms and Forwarded to the Engineer for review and approval.

9.7 Operate and maintain pumps so that a continuous stream of concrete is delivered into the forms without air pockets, segregation, or change in slump exceeding 5 cm.

9.8 Once the transit mixer arrived on site, concrete supplier technician shall carry-out the testing and sampling of fresh concrete as per specifications.

Note: Data to be maintained by the concrete supplier technician are as follows:
Location of structure or element, Volume of concrete placed, Time of placement and finish, Batching time at batching plant be recorded, slump at batch plant should be noted, Temperature during placing should be noted.

9.9 Scaffold inspection to be carried out where required.

9.10 No samples should be taken before 10 % or after 90 % of the batch has been discharged.

9.11 The elapsed time shall not exceed 15 min. between obtaining the first and final portions of the composite sample.

9.12 Maximum vertical drop in placing concrete shall not exceed 1.5 m (as per MOI-03300/3.04/D/8).

9.13 Use cement grout consisting of equal parts Portland cement and fine aggregate by weight and not more than 24 liters of water per sack of cement. Apply with a stiff broom or brush to a minimum thickness of 2 mm. Deposit fresh concrete before cement grout has attained its initial set.

10. ATTACHMENTS

10.1. HSE Risk Assessment
10.2. ITP
10.3. Check Lists

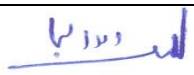
METHOD STATEMENT BRIEFING RECORD
(Concrete Works)

Briefing delivered by: Sherif Hammam

Position: QA/QC Manager

Date: 07.12.2015

We (the undersigned) have read and understood the attached method statement and will comply with the specified requirements and control measures. If the work activity changes or deviates from that originally envisaged, we will seek further advice and request an amended method statement.

NAME & SURNAME	POSITION	SIGNATURE	DATE
Kahlil Mahmoud	Project Director		22.12.2015
Sherif Hammam	QA/QC Manager		22.12.2015
Mohamed Aboalnaga	P.M. (Jizan Sector)		23.12.2015
Alaa Elkayyas	P.M. (Abha Sector)		
Islam Adbul Hady	P.M. (AlBaha Sector)		
Matiur Rahman	HSE Manager		

Appendix 1

HSE Risk Assessment

Risk Assessment Analysis (Safety & Health): Method Statement for Concrete Works

	ACTION / HAZARD SOURCE	GENERAL RISK / POTENTIAL CONSEQUENCES	INITIAL RISK			CONTROL MEASURES TO BE TAKEN	RESIDUAL RISK			Risk Acceptable
			Severity	Likelihood	Initial Risk Factor		Severity	Likelihood	Residual Risk Factor	
1.	Delivery of formwork, rebar and concrete	Movement of traffic-potential for accidents , personal injury and environmental damage	3	4	12	1. Coordinate with the project site regarding the delivery location 2. Observe site traffic rules of vehicles 3. Observe proper lifting posture 4. Ask for assistance in lifting heavy things				
		Crushing of person by reversing vehicle				1. A banks-man or a concrete pump operator must direct the driver while reversing the vehicle 2. Truck mounted mobile concrete pumps and truck mixer must be with warning beeper which is activated when reverse gear is selected.				
2.	Loading/unloading of cut and bent rebar bundles and form work panels	Injury due to lifting equipment failure	2	3	12	1. Toolbox meeting shall be held prior to commencement of all activities. 2. Ensure that lifting equipment is positioned on a hard and stable surface 3. Any safety device installed on lifting equipment will be operational. 4. Load will not exceed dynamic and/or capacities of lifting equipment. 5. All Lifting equipment slings and shackles will be examined by the responsible person(s)	1	2	2	Low
3.	Shifting of cut-and-bent rebar bundles and formwork panels	Crushing may be cause death or permanent disability	3	3	9	1. Prepare a lifting plan. 2. Use only qualified operator. 3. Do not stand beneath a lift. 4. Use personal protective equipment (PPE). 5. Ensure loads are slung correctly. 6. All lifting equipment to be maintained regularly. 7. Lift area to be demarcated to restrict access.	1	2	2	Low

ACTION / HAZARD SOURCE		GENERAL RISK / POTENTIAL CONSEQUENCES	INITIAL RISK			CONTROL MEASURES TO BE TAKEN	RESIDUAL RISK			Risk Acceptable
			Severity	Likelihood	Initial Risk Factor		Severity	Likelihood	Residual Risk Factor	
4.	Erection and dismantling of formwork panels	Collapse of formwork panels may cause death or permanent disability				1. Adequate temporary bracing must be in place while initially setting formwork. 2. All form components must be inspected regularly for damage or excessive wear.				
		Falling form work while attempting to walk and stand on or use a ladder				1. Walkways systems must be in place along the upper level of formwork. 2. Access ladders or other suitable safe methods must be obtain access to walkway platforms.				
5.	Storage of form release oil and supplementary plastic material	Volatile organic components and other sources of ignition may cause fire and damage to environment.	4	4	16	1. Chemicals management procedure on storage and handling. 2. Safety Sign board; 3. Fire Fighting equipment. 4. Store materials in accordance with the manufactures materials safety data sheet (MSDS)	2	2	4	
6.	Application of form release oil	Skin and eye contact	4	3	12	1. Protective working clothes, gloves, goggles and eye/face protection against splashing. 2. Portable washing and eye wash facilities to be provided.	1	3	3	
		Inhalation of vapour	4	3	12	1. Personal should wear mask. 2. Sufficient ventilation to be provided.	1	3	3	
		Ingestion of material	2	2	4	1. Wash hands before breaks and after finishing work.	1	2	2	
7.	Installation of steel reinforcement	Back injury due to manual handling	3	3	9	1. Each worker will not handle more than 25 Kg	1	2	2	
		Injury to hand and foot due to sharp surfaces of cut rebar and tie wires	2	2	4	1. Use proper PPE at all times. 2. Forbid access for other personal.	1	2	2	

	ACTION / HAZARD SOURCE	GENERAL RISK / POTENTIAL CONSEQUENCES	INITIAL RISK			CONTROL MEASURES TO BE TAKEN	RESIDUAL RISK			Risk Acceptable
			Severity	Likelihood	Initial Risk Factor		Severity	Likelihood	Residual Risk Factor	
		Injury due to slips, trips and falls on wet, slippery and greasy floors.	3	3	9	1. Wear safety shoes with non-skid soles. 2. Keep work area clear of trip hazards at all times. 3. Ensure that the working area is well lit, passageways are clearly defined.	1	2	2	
		Death or injury due to falling on projecting rebar dowels				1. Place impalement protection caps				
8.	Operation of concrete pump	Accident due to overturning/collapse of the pump				1. All the stabilizers must be extended and lowered before the boom is raised.				
		Injury while taking concrete samples from pump hopper				1. No worker should reach their hands into, or near the hopper while the pump engine is running. 2. Pump operator should never operate a concrete pump without a grate on the hopper.				
		Injury due to hose whipping				1. All personnel should remain 3m away from the end of the delivery line until air is exhausted from the system and concrete is free flowing once more. 2. Only one person will be in-charge of giving direction for the movement of the boom.				
9.	Irritation to bare skin and eye due to splattering of wet concrete	Irritation to bare skin and eye due to splattering of wet concrete.	4	3	12	1. Medical staff as well as appliers to be familiarize with substances used through MSDS and other sources of information. 2. Personal should wear gloves and provide eye/face protection 3. Portable washing and eyewash facilities to be provided. 4. Adequate lighting will be provided to all working areas during night works.	1	3	3	

ACTION / HAZARD SOURCE	GENERAL RISK / POTENTIAL CONSEQUENCES	INITIAL RISK			CONTROL MEASURES TO BE TAKEN	RESIDUAL RISK			Risk Acceptable
		Severity	Likelihood	Initial Risk Factor		Severity	Likelihood	Residual Risk Factor	
	Vibrators connected to the site distribution board may cause electrical shock due to faulty usage and extension cable.	5	3	15	1. Earth leakage switches on all circuits. 2. Routine check for extension cable and sockets. 3. Only qualified personnel shall operate the machine.	2	2	4	Low

LIKELIHOOD

1 -Extremely improbable–So unlikely to occur
2-Extremely remote–Unlikely to occur
3 -Remote- May occur in time
4 -Reasonably probable-Probably will occur in time.
5 -Probable-Likely to occur immediately or shortly

RISK FACTOR MATRIX

Likelihood \ Severity	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

RISK PRIORITY	
1-4	Low Risk
6	Medium Risk
8-16	High Risk

Methodology
1. Identify Hazards
2. List Hazard Event
3. Calculate risk factor with initial risk rating i.e., probability x severity
4. Detail controls
5. Calculate residual risk factor with final risk rating
6. Enter risk priority

Evaluate acceptability of risk

SEVERITY
1 – No Injury– No foreseeable injury or damage.
2 – Negligible – Hazard will not result in serious injury or illness, remote possibility of damage beyond minor first aid case.
3 – Marginal - Hazard can cause illness, injury or equipment damage, but results would not be expected to be serious
4 – Critical – Hazard can results in serious illness, severe injury, property and equipment damage
5 – Catastrophic – Imminent danger exists, hazard capable of causing death and illness on a wide scale

Appendix 2

Inspection and Test Plan

THE CONTRACTOR	THE OWNER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4	GESBAU ZACE ITALCONSULT

ITP Details

Inspection & Test Plan for Concrete Works

Item No.	Activity Description	Survey, Test or Inspection Method	Acceptance Criteria	Ref. Standard/Specification/Method Statement and/or Drawing No.	Frequency	Verification Personnel	Action			Verifying/Record Document
							S	C	E	
	Blinding Concrete									
1	Approval of documents and materials related to blinding of concrete.		All relevant documents shall be approved by Engineer. The Mix Design shall be in accordance with ACI.	*Approved project quality plan. *Construction Drawing. *Approved Materials. *Approved Mix Design. *Approved QC procedure.	For each documents upon issuance / Any change at the source and type of the Mix materials and proportioning.		H	H	H	Approved submittals / Documents
2	Check for underground services (if any).		Follow the existing services drawings.	*Existing services Drawing (If any).	N/A		H	R	R	Existing condition Report.
3	Check for dewatering system and water table.		*Water table minimum 300mm below the bottom level of excavation. *Continuous dewatering. *Additional pump available in case of breakdown.	*Approved subcontractor. *Approved MS for concrete works.	N/A		H	W	W	Check list for blinding works.
4	Over excavation as compare to the construction drawing.		Over excavated area to be filled with approved suitable material / blinding concrete.	*Approved construction drawings.	Following the completion of leveling		H	W	W	Checklist for blinding works.
5	Compaction / Trimming of the bottom of excavation to the required level and removing all loose materials.		*As per approved MS. *Compacted Surface.	*Approved construction drawings. *Contract specifications.	Following the compaction of levelling / proof rolling.		H	H	R	Checklist for Blinding Concrete.
6	Anti-Termite application in bottom of blinding.		*As per approved material. *After the application bottom should be immediately covered with black plyetehne sheet for casting blinding.	*Approved construction drawings. *Approved materials for anti-termite application. *Approved supplier & subcontractor.	Prior to each pouring of blinding concrete.		H	H	S	Checklist for Blinding Concrete.
7	Laying polythene sheet at the bottom of excavation (if applicable)		Approved material with 300mm joints overlapped and masking tape adhered.	*Approved construction drawings. *Contractor specifications.	Prior to each blinding pour.		H	R	R	Checklist for Blinding Concrete.

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ITP Details

Inspection & Test Plan for Concrete Works

Item No.	Activity Description	Survey, Test or Inspection Method	Acceptance Criteria	Ref. Standard/Specification/Method Statement and/or Drawing No.	Frequency	Verification Personnel	Action			Verifying/Record Document
							S	C	E	
8	Blinding Level		*Top level marked by the surveyor giving concrete pads as bench marks as per approved drawings. *No rebar pegging for levels pegging for levels piercing the polythene surveyors log sheet.	*Approved construction Drawing *Approved MS for concrete works.	Prior to each blinding pour.		H	R	R	Checklist for Blinding Concrete.
9	Inspection prior to placing blinding concrete.		*Bottom level of excavation as per approved drawings. *Compacted surface. *Field density report. *Proper cleaning.	* Approved construction drawing *Approved method of statement.	Prior to each blinding pour.		H	H	R	Checklist for Blinding Concrete.
10	Placing of blinding concrete after approval by Engineer.		*Approved construction drawings. *Approved Method of Statement for concrete works. *Approved Mix Design	*Concrete placed without cold joint. *Top level of concrete maintained and steel trowel finish to receive water proofing. *After finishing the surface blinding covered with polythene sheets immediately.	Prior to each blinding pour.		H	H	H	Checklist for Blinding Concrete.
11	Protection of freshly laid blinding concrete from any kind of damage.		*Restrict the area from foot traffic. *Carefully lay the polythene sheets to avoid any foot impressions.	*Approved construction drawings. *Approved MS for concrete work	N/A		H	R	R	N/A
12	Curing of fresh concrete		Only fresh water will be used for curing.	*Approved MS for concrete works.	Daily following the casting day for 7 days.		H	R	S	Checklist for Blinding Concrete.

Legend: **H** - Hold Point (signature required to proceed) **S** - Surveillance (random attendance, no signature) **S** - Subcontractor **E** - ENGINEER
W - Witness (attendance expected, signature on check sheet) **R** - Record review **C** - Contractor **ITL** - INDEPENDENT TESTING LABORATORY

THE CONTRACTOR	THE OWNER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4	GESBAU 2ACE ITALCONSULT

ITP Details

Inspection & Test Plan for Structure

Item No.	Activity Description	Survey, Test or Inspection Method	Acceptance Criteria	Ref. Standard/Specification/Method Statement and/or Drawing No.	Frequency	Verification Personnel	Action			Verifying/Record Document
							S	C	E	
STRUCTURAL CONCRETE WORKS										
1	Approval of documents and materials related to concreting.		All relevant documents shall be approved by Engineer.	*Approved project quality plan. *Construction Drawing. *Approved procedure & MS for concrete works. *Approved Mix Design.	For each documents upon issuance / Any change at the source and type of the Mix materials and proportioning.		H	H	H	Approved submittals / Documents
SUB-STRUCTURE										
2	Check for Existing underground services (if any).		Follow the existing services drawings.	* As built drawing.	N/A		H	H	R	As built drawing
3	Check for new underground services (if any).		Underground services installed as per latest construction drawing.	*Construction MEP drawings. *Construction underground services drawing.	N/A		H	R	R	Checklist signed off by MEP coordinator.
4	Layout of the sub-structure.		Surveyor verifies the layout and signs on the Log Sheet.	*Construction drawings. *Approved BM & reference points.	N/A		H	R	R	Log Sheet signed off by the surveyor.
5	Inspection of reinforcement for raft / footing / grade slab etc. of sub-structure.		*As per approved method of statement. *Construction drawings. *Approved materials.	*Approved construction drawings. *Approved procedure & MS for concrete works. *Approved material submittal.	100% inspection.		H	H	R	*Checklist for concrete works. *Bar Bending Schedule.
6	Installation of water stop bar (if existing on drawing) for sub-contractor.		*As per approved material. *Approved Drawings. *Manufacturer recommendation.	*Approved construction drawings. *Approved procedure & MS for concrete works. *Approved material submittal.	100% inspection.		H	R	S	Checklist for concrete works.
7	Formwork for sub structure.		*As per approved method of statement. *Construction drawings.	*Approved construction Drawing *Approved procedure & MS for concrete works. *Approved procedure & MS for block work (if applicable). * Approved material submittal.	100% inspection.		H	H	R	Checklist for concrete works.
8	Inspection for installation of MEP embeds raft / footing / grade slab etc. of sub-structure.		*As per construction drawing. *MEP coordinator signs off the relevant checklist.	*Construction drawings for MEP works. *Approved procedure & MS for concrete works. *Approved material submittal.	100% inspection.		H	H	H	Checklist for concrete works.
9	Check for the starter bars in correct location, clear space, diameter of bars, number of bars, height protruding above.		*As per construction drawing.	*Construction drawings for MEP works. *Approved procedure & MS for concrete works. *Approved material submittal.	100% inspection.		H	R	R	Checklist for concrete works.
10	Cleaning sub-structure.		*As per approved MS.	*Approved procedure & MS for concrete works.	100% inspection.		H	H	R	Checklist for concrete works.

THE CONTRACTOR	THE OWNER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia	GESBAU 2ACE ITALCONSULT

The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz
Project KAP5- Group 4

ITP Details

Inspection & Test Plan for Structure

Item No.	Activity Description	Survey, Test or Inspection Method	Acceptance Criteria	Ref. Standard/Specification/Method Statement and/or Drawing No.	Frequency	Verification Personnel	Action			Verifying/Record Document
							S	C	E	
11	Inspection prior to casting the raft / footing / grade slab etc. of sub-structure.		*As per construction drawings. *Forms in good condition. *Proper cleaning. *Clear space to steel bars.	*Approved construction drawings. *Approved procedure & MS for concrete works. *Approved material submittal.	100% inspection.		H	H	H	Checklist for concrete works.
12	Check for proper access, arrangement for casting concrete, including sampling and testing of fresh concrete.		*Construction drawing for sub-structure. *Spare Vibrators. *Alternate arrangement in case of breakdown.	*Concrete sampling, handling, and testing as per ASTM, ACI & SAOS standards. *Concrete specification.	7 Cylinders for each 50m3 or less, shall be for daily production.		H	R	S	Checklist for concrete works.
13	Pouring concrete in the raft / footing / grade slab etc. sub-structure.		*Casting should be in layer. *Continuous casting. *No cold joints. *Level of concrete monitored while casting.	* Approved construction drawings. *Approved procedure & MS for concrete works. *Concrete specification.	N/A		H	H	H	Checklist for concrete works.
14	Protection of the freshly laid concrete from any kind of damage.		*Restrict the area from foot traffic. *Carefully lay the polythene sheets to avoid any foot impressions.	* Approved construction drawings. *Approved procedure & MS for concrete works. * Concrete specification.	N/A		H	W	S	Checklist for concrete works.
15	Water curing / water proofing primer applied on the concrete in compliance to manufacturer's recommendation where ever required.		*Continuous water curing where ever required. *Wet hessian and after polythene sheet will be laid / wrapped over concrete member.	* Approved construction drawings. *Approved procedure & MS for concrete works. *Concrete specification *Approved material for curing compound.	7 Days minimum surveillance for each newly casted elements / structures and attaining 28 days required strength required.		H	W	S	Checklist for concrete works.
16	Striking forms concrete sufficiently set and hardened.		*No honeycombing / defects in concrete. 8Concrete surface should be within permissible limits of tolerance.	*Contract specifications. *Approved field Quality control for concrete works.	N/A		H	R	S	Checklist for concrete works.
17	Post pour inspection after stripping the forms.		*No honeycombing. *No distortion of sub-structure. *Concrete surface plane.	* Approved construction drawings. *Approved procedure & MS for concrete works. *Concrete specification.	Surveillance		H	R	R	Checklist for concrete works.

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The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz
Project KAP5- Group 4

ITP Details

Inspection & Test Plan for Structure

Item No.	Activity Description	Survey, Test or Inspection Method	Acceptance Criteria	Ref. Standard/Specification/Method Statement and/or Drawing No.	Frequency	Verification Personnel	Action			Verifying/Record Document
							S	C	E	
18			As per approved procedure & MS by engineer and manufacture recommendations.	*Approved construction drawings. *Approved procedure & MS for concrete repair works. *Approved material submittal.	Surveillance		H	R	S	_
SUPER-STRUCTURE										
19	Preparation of construction joints and cleaning of the starter bars.		*Laitance removed. *Starter bars free of rust and cleaned.	*Approved MS for super structure. *Construction Drawings. *Concrete specifications.	100% inspection.		H	R	R	Checklist for procedure & MS for concrete works.
20	Layout for the columns / walls / slabs / beams / up-stands etc. of super structure.		Surveyor verifies the layout and signs on the log-sheet.	*Approved MS for super structure. *Construction Drawings. *Approved BM & Reference points.	N/A		H	H	R	Log-Sheet sinned off by the surveyor.
21	Installation of the reinforcement for the column / beam / slab / walls / up-stands / thermocouple wires for temperature in mass concreting etc. of super structure.		*Approved MS for super structure. *Construction Drawings. *Concrete specifications.	* Approved procedure & MS for super structure. * Shop Drawings. * Concrete specifications. *Approved material submittal.	100% inspection.		H	R	S	Checklist for concrete works.
22	Installation of the MEP embeds for the columns / walls / slabs / beams / up-stands etc. of super-structure.		As per the construction drawing MEP coordinator signs off the relevant checklist.	*Construction drawings for MEP works. *Approved procedure & MS for super structure. * Approved Material Submittal.	100% inspection.		H	H	R	Checklist for concrete works.
23	Inspection of reinforcement for the columns / walls / slab / beams / up-stands / thermocouple wires for temperature control in mass concrete etc. of super structure before closing the forms.		*Approved MS & Procedure for super structure. *Construction Drawings. *Approved materials. *Clear Space to reinforcement.	* Approved procedure & MS for super structure. * Shop Drawings. * Concrete specifications. *Approved material submittal. *Approved Bar Bending Schedule (BBS).	100% inspection.		H	H	R	Checklist for concrete works.
24	Closing forms after Engineers inspection and approval of reinforcements.		*As per approved drawing for procedure & MS in good condition. *Concrete cover is maintained.	works. *Approved procedure & MS for super structure. * Approved Material Submittal. * Concrete Specifications.	100% inspection.		H	R	S	Checklist for concrete works.
25	Inspection of formwork for the columns / walls / beams / slabs / up-stands etc. of super-structure before casting concrete.		*Approved MS & Procedure for super structure. *Construction Drawings. *Approved materials. *Clear Space to reinforcement.	*Construction drawings for MEP works. *Approved procedure & MS for super structure. * Approved Material Submittal. *Contract Specifications.	100% inspection.		H	H	R	Checklist for concrete works.
26	Check the proper access, arrangement for casting concrete, including sampling and testing of fresh concrete.		*Approved procedure & MS for super structure. *Spare vibrators. * Alternate arrangement in case of breakdown.	*Approved procedure & MS for super structure.	N/A		H	R	S	Checklist for concrete works.

THE CONTRACTOR	THE OWNER	THE ENGINEER
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ITP Details

Inspection & Test Plan for Structure

Item No.	Activity Description	Survey, Test or Inspection Method	Acceptance Criteria	Ref. Standard/Specification/Method Statement and/or Drawing No.	Frequency	Verification Personnel	Action			Verifying/Record Document
							S	C	E	
27	*Pouring concrete in the columns / walls / slabs / beams / beams / up stands etc. of the super-structure. *Checking the slump according to the relevant mix design.		* Casting in layers. *Continuous casting. *No cold joints. *Level of concrete.	*Approved procedure & MS for super structure. * Concrete Specifications.	100% inspection.		H	H	H	*Checklist for concrete works. *Concrete pour-card.
28	Protection to the freshly laid concrete from any kind of damage.		*Restrict the area from the foot traffic. *Carefully lay the polythene sheets to avoid any foot impression.	*Approved procedure & MS for super structure.	N/A		H	W	S	Checklist for concrete works.
29	Curing of concrete and temperature recording by thermocouple extension cables via approved thermocouple thermometer and filling the temperature record of mass concrete to the form.		As per manufacturers recommendations.	*Approved procedure & MS for super structure. * Approved Material Submittal.	7 Days surveillance for each newly casted element / structure.		H	R	W	Temperature Record Form.
30	Striking forms after 12hours minimum and concrete to check weather concrete is sufficiently hardened / set.		*No honeycombing / defects in concrete. *Concrete surface within tolerance limits.	*Approved procedure & MS for super structure. * Concrete Specifications.	N/A		H	W	S	Checklist for concrete works.
31	Post pour inspection after striking forms.		*No honeycombing / defects in concrete. *Concrete surface within tolerance limits.	*Approved procedure & MS for super structure. * Concrete Specifications.	Surveillance		H	R	R	Checklist for concrete works.
32	Water proofing works.		All relevant submittal shall be approved by Engineer.	*Approved submittal for sub-Structure water proofing. *Approved material submittal.	For each documents upon issuance / Any changes at the source and type of the material or its ingredients.		H	H	H	Supervising Engineer for waterproofing works.
33	Repair / making good columns / walls / beams / up-stands / slab etc. of superstructure.		* As per manufacturers recommendations. *Approved procedure & MS for super structure.	*Approved procedure & MS repair / making good. * Concrete Specifications. * As per manufacturers recommendations. * Approved materials submittal	Surveillance		H	R	S	_
34	Protection of starter bars / dowels from getting corroded.		*Approved procedure & MS for super structure.	*Approved procedure & MS repair / making good. * Concrete Specifications.	N/A		H	R	S	_

Legend: **H** - Hold Point (signature required to proceed) **S** - Surveillance (random attendance, no signature) **S** - Subcontractor **E** - ENGINEER
W - Witness (attendance expected, signature on check sheet) **R** - Record review **C** - Contractor **ITL** - INDEPENDENT TESTING LABORATORY

Appendix 3

Inspection Checklists

THE CONTRACTOR	THE EMPLOYER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia Custodian of Two Holy Mosques the King Abdullah Bin Abdulaziz's Project KAP5 - Group4)	GESBAU 2ACE ITALCONSULT

INSPECTION CHECK LIST FOR STEEL WORK	Rev:00	IR No:
	Sub-Contractor:	
LOCATION:	PAD/FOUNDATION :	
SCHEDULED INSPECTION DATE & TIME :		
Actual INSPECTION DATE & TIME :		

Item No	ACCEPTANCE CRITERIA	PASS	FAIL	NA	Signature	NCR no. & Ref.	Re-insp. Date
A	**SPECS. & DRAWINGS**						
A1	Related Specifications & Drawings are submitted and approved.						
B	**Steel work**						
B1	Availabilty of approved Method statement, ITP, Barbending schedule and IFC drawing.						
B2	Steel supplier is approved and certified.						
B3	Horizontal and Vertical Spacing Within Tolerance.						
B4	Number of bar vetical & horizontal is checked and as per drawing.						
B5	Overlaping of the steel bars is as per specification and standards.						
B6	Supporting system (Chairs or Blocks) are provided correctly.						
B7	Splicing of steel is of proper length and at proper location.						
B8	The Rebar is stright (Not bent and kinked) and free from rust.						
B9	Clearance or Spacing from Forms/Ground is provided as per specification.						
B10	Dowels placed properly.						
B11	Rebar Size as per the approved drawing and design.						

CONTRACTOR	ENGINEER
Date:	Date:
Name:	Name:
Signature:	Signature:

THE CONTRACTOR	THE EMPLOYER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia Custodian of Two Holy Mosques the King Abdullah Bin Abdulaziz's Project KAP5 - Group4)	GESBAU ZACE ITALCONSULT

INSPECTION CHECK LIST FOR FORM WORK	Rev:00	IR No:
	Sub-Contractor:	
LOCATION:	PAD/FOUNDATION :	
SCHEDULED INSPECTION DATE & TIME :		
Actual INSPECTION DATE & TIME :		

Item No	ACCEPTANCE CRITERIA	PASS	FAIL	NA	Signature	NCR no. & Ref.	Re-insp. Date
A	**SPECS. & DRAWINGS**						
A1	Related Specifications & Drawings are submitted and approved.						
B	**Form work**						
B1	Availabilty of approved Method statement, ITP.						
B2	The steel work been inspected and cleared for casting.						
B3	Working scaffolds, ladders, runways, ramps and crossings are as per required standard.						
B4	Housekeeping around working area and passage.						
B5	All props and shores are adequat to handle all the loads. The verticality, height and spacing between props is proper. Props are placed on hard bearing surface.						
B6	Position of the formwork from predetermined grids i.e. Alignment & Orientation checked against the grids						
B7	Safe nailing and firm locking of clamps and props.						
B8	Peripheral edges and floor openings is been guarded.						
B9	Plumb of the formwork both ways is been checked and securely supported using props.						
B10	Lateral stability of formwork and complete fixity at the joint between props.						
B11	Diagonal of the form work is checked and the sides of the form is at 90°.						
B12	Form work for footing and strap beams if any is checked for firmness, support and cleanliness.						
B13	Cover blocks/ spacers placed as per specifications						
B14	Set backs with references to demarcation points checked						

CONTRACTOR	ENGINEER
Date: Name: Signature:	Date: Name: Signature:

THE CONTRACTOR	THE EMPLOYER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia Custodian of Two Holy Mosques the King Abdullah Bin Abdulaziz's Project KAP5 - Group4)	GESBAU 2ACE ITALCONSULT

CONCRETE PERMISSION			IR No.:
Work description:			Date:
Sub-Contractor(if any):	**Inspection Classification:**	**QA/QC:**	Area:
	Contractor:	**Engineer:**	Location:

POURING PLAN INFORMATION	
Originator:	Date:
Batch Plant:	Quantity (m3):
Design Mix:	Ambient Temp.:
Required Finish / Curing:	Concrete Slump:
Special Instructions:	Specified Slump:

PRE POUR RELASE	
Civil	Date:
Mechanical	Date:
Electrical	Date:
HSE	Date:
Survey	Date:
Quality Control	Date:

POUR		
Placement Started:	Date:	Time:
Placement Completed:	Date:	Time:

Volume of Concrete (m3) Placed:

Remarks:

CONTRACTOR	ENGINEER
Date: Name: Signature:	Date: Name: Signature:

CONTRACTOR	EMPLOYER	CONSULTANT
Bec	Ministry of Interior Kingdom of Saudi Arabia	GESBAU 2ACE ITALCONSULT

Project: The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4

CONCRETE FIELD REPORT

GRADE OF CONCRETE		SUPPLIER OF CONC.		
LOCATION OF STRUCTURE				
DATE OF CASTING		Number Of Cylinders Taken:		Vol.: m3
Date of crushing after 7days:		Date of crushing after 28days:		

Serial No.	Truck No. -	Batch Ticket No.	Dispatch Time (pm)	Volume (m3)	Running Volume (m3)	Arrival Time (pm)	Start Unloading (pm)	Finish Unloading (pm)	Air Temp. (°c)	Concrete Temp. (°c)	Slump (mm)	Remarks

Contractor	Sampled By:	Checked:	Date:
Consultant	Witnessed By:	Checked:	Date:

THE CONTRACTOR	THE EMPLOYER	THE ENGINEER
Bec	Ministry of Interior Kingdom of Saudi Arabia	GESBAU 2ACE ITALCONSULT
	The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4	

CRUSHING TEST RECORD

Supplier of Concrete: **Vol.:**

S. NO.	DISCRIPTION	GRADE OF CONC.	TRUCK NUMBER	DATE OF CASTING	DATE OF CRUSHING	WEIGHT (KG)	AGE (DAYS)	STRENGHT (KG/CM²)	STRENGHT (MPA)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Engineer	Contractor	ITL
Date:	Date:	Date:
Name:	Name:	Name:
Signature:	Signature:	Signature:

CONTRACTOR	EMPLOYER	CONSULTANT
Bec	Ministry of Interior Kingdom of Saudi Arabia	GESBAU ZACE ITALCONSULT

The Custodian of Two Holy Mosques King Abdullah Ibn Abdul-Aziz Project KAP5- Group 4

SUMMERY OF CASTING & CONCRETE RESULTS

Grade of Concrete:		Date of Casting:	
Location Of Concreting:		Total Volume of Concrete Used:	

S. No.	DATE OF CASTING	BATCH PLANT	GRADE	LOC. / AREA	CYLN. QTY	COMPRESSIVE STRENGHT TEST (N/MM2)					Remarks
						CRUSHING DATE AFTER 7 DAYS	STRENGH	CRUSHING DATE AFTER 28DAYS	STRENGH	QUANTITY	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Contractor		Consultant	
Inspection Leevel: Date: Name: Signature:		Inspection Leevel: Date: Name: Signature:	